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REMARKS

The Office Action of May 3, 2005 was received and carefully reviewed. Reconsideration and withdrawal of the currently pending rejections are requested for the reasons advanced in detail below.

Filed concurrently herewith is a Request for a One Month Extension of Time, which extends the shortened statutory period of response to September 6, 2005 (September 3rd falling on a Saturday and Monday, September 5th being a federal holiday). Accordingly, Applicants respectfully submit that this response is being timely filed.

Claims 1-44 were pending prior to the present response. By this amendment, claims 3, 18, 20, 42 and 43 are amended. Consequently, claims 1-44 are currently pending in the instant application. Claims 2, 4-7, 9, 11-17, 19, 21-26, 28, 30-35, 37 and 39-44 are withdrawn from consideration as being drawn to non-elected Species 2-8 set forth in the Election requirement dated December 28, 2004.

The amendment to claim 3 recites the steps of forming a second amorphous semiconductor film over a first amorphous semiconductor film and heating the first amorphous semiconductor film and the second amorphous semiconductor film, and to broaden the claim in some respects. Support for this amendment is found, for example, in the specification at lines 18-20 of page 17. Claims 18 and 20 are amended to change "dry" etching to "wet" etching. This feature of wet etching of the second amorphous semiconductor film finds support, for example, in lines 21 to 24 of page 17 of the specification. Claims 42 and 43 are amended to correct a minor informality.

Additionally, the Abstract of the Disclosure is amended to correct minor informalities.

In the Office Action, starting at page 2, claims 1, 3, 8, 10, 18, 20, 27, 29, 36 and 38 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Nakamura et al. (U.S. Patent Application Publication No. 2002/0134981). This rejection is respectfully traversed.

Each of independent claims 1 and 3 recite, among other features, that a second amorphous semiconductor film is formed over a first semiconductor film, heating the first semiconductor film and the second amorphous semiconductor film, and removing the second amorphous semiconductor film. The second amorphous semiconductor film includes nitrogen at a concentration of 1×10^{18} atoms/cm³ or lower, oxygen at a concentration of $8 \times$

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10^{19} atoms/cm³ or lower, and noble gas at a concentration of 1×10^{20} atoms/cm³ or higher. With respect to these features, the Examiner asserts that the Nakamura et al. application publication discloses, with reference to page 9, paragraph 0117 and page 3, paragraphs 0022-0023, a second amorphous semiconductor film including nitrogen at a concentration of 1×10^{18} atoms/cm³ or lower, oxygen at a concentration of 8×10^{19} atoms/cm³ or lower, and noble gas at a concentration of 1×10^{20} atoms/cm³ or higher, as claimed. However, the oxygen concentration mentioned in Nakamura et al. is not an oxygen concentration in the second amorphous semiconductor film, which allegedly corresponds to the claimed second semiconductor film. Rather, the oxygen concentration relied upon relates to the semiconductor film in Nakamura et al. that is to be crystallized for forming a TFT (see page 3, paragraph 0022 or page 4, paragraph 0059). Thus, the semiconductor film to serve as a gettering sink is different from the semiconductor film to be crystallized in which an impurity region is to be formed. Hence, the oxygen concentration of the film relied upon by the Examiner is not the same as that of the second amorphous semiconductor film of the pending claims.

Similarly with respect to the claimed rare (noble) gas concentration, the rare noble gas concentration mentioned in the Nakamura et al. application publication, which is relied upon by the Examiner, is not a rare gas concentration in the second amorphous semiconductor film alleged to correspond to the claimed second semiconductor film. Rather, it is a concentration in the semiconductor film that is to be crystallized for forming a TFT (see, page 3, paragraph 0022). Thus, the semiconductor film to serve as a gettering site is different from the semiconductor film to be crystallized in which an impurity region is to be formed. Hence, the disclosure relied upon in Nakamura et al. for describing the claimed noble gas concentration is not the same what is recited in claims 1 and 3.

Applicants respectfully submit that the claimed combination of oxygen, nitrogen and rare gas concentrations are not a trivial distinction. For example, the claimed combination of oxygen, nitrogen and rare gas concentrations reduce etch residue, which would otherwise lead undesirable defects, leakage and low reliability. Hence, the second amorphous semiconductor film set forth in claims 1 and 3 exhibits an advantageous effect in that it can be removed with less residue, when nitrogen, oxygen and a rare gas in the second amorphous semiconductor film all meet the conditions of the claimed concentrations. See, for example,

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lines 1-4 of the present application.

An example of a related art film is described in U.S. Patent No. 6,048,758 to Yamazaki et al., which Applicants submitted in the Information Disclosure Statement filed on November 17, 2003. As describes in this patent, oxygen and nitrogen concentrations of an amorphous silicon film are close to the respective concentrations recited in the pending claims (e.g., see lines 39 to 45 of column 3). However, the Yamazaki et al. patent does not describe all the features of the present invention as recited in claims 1 and 3 because Yamazaki et al. does not describe the rare gas concentration of the amorphous silicon film. Thus, combination of features recited in claims 1 and 3, which include the claimed oxygen, nitrogen and rare gas conditions of concentrations in a second amorphous film, along with the attendant advantages described above, are not disclosed in the Yamazaki et al. patent.

Additionally, with respect to the claimed nitrogen concentration, the Examiner mentions the concentration of an element belonging to Group 15 (such as N, As or P) described in Nakamura et al. However, the concentration of the element belonging to Group 15 is a concentration of the element that has been added into the semiconductor film as a donor to form an impurity region of a TFT, and that the semiconductor is not an amorphous semiconductor serving as a gettering sink (which must be later removed). For example, pages 9 to 10, paragraphs 0115 to 0120 of Nakamura et al. describe a doping process for an element belonging to Group 15 (here, phosphorus) to form an impurity region of a TFT. Hence, it is respectfully submitted that the Nakamura et al. publication does not describe that the Group 15 element is included in the second amorphous semiconductor film serving as a gettering sink.

For at least these reasons, Applicants submit that the concentrations described in Nakamura et al. are different from those set forth in claims 1 and 3. As such, Nakamura et al. fails to anticipate these claims.

Claims 8, 10, 18, 20, 27, 29, 36 and 38 depend from one of claims 1 and 3, and are therefore patentable at least for the above reasons. In addition, these claims recite combinations including additional features not described in the Nakamura et al. application publication.

Finally, it is respectfully submitted that the restriction requirement dated December 28, 2004, mischaracterizes at least independent claim 1 as not being generic to all Species 1-8

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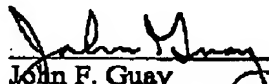
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as characterized by the Examiner on pages 2-3 of the requirement. The Examiner's attention is directed to MPEP §806.04(f), which instructs that for claims to be restricted to different species, they must be mutually exclusive. In the present case, it is respectfully submitted that no features recited in at least claim 1 are found in to exist in one alleged species, but not in another under Applicants' disclosure. To the contrary, claim 1, which is directed to a process for fabricating a thin film transistor, uses the open-ended transitional phrase "comprising," which, under Applicants' disclosure, allows for the features set forth in each of the Examiner's species characterization. To this end, the Examiner is requested to clarify why claim 1 cannot be considered generic with respect to each of Species 1-8.

In view of the foregoing, it is respectfully requested that the rejection of record be reconsidered and withdrawn by the Examiner, and that the application be passed to issue. If a conference would expedite prosecution of the instant application, the Examiner is hereby invited to telephone the undersigned to arrange such a conference.

Respectfully submitted,



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